

TABLE 3.—Late seismological reports (instrumental)—Continued.

Date.	Charac- ter.	Phase.	Time.	Period. T.	Amplitude.		Dis- tance.	Remarks.
					A <sub>m</sub>	A <sub>N</sub>		

Massachusetts. Cambridge—Continued.

1918. Nov. 23	-----	O	H. m. s. 22 58 11	Set.	μ	μ	Km.	94° 57'. Δ and O from L <sub>m</sub> -S <sub>m</sub> . N much masked by microseisms.
		on	23 09 31	3			10,550	
		is	23 09 51	6				
		S <sub>m</sub>	23 17 02	6				
		iv	23 26 34					
		iv?	23 26 57	8				
		eL <sub>m</sub>	23 34 40	24				
		eL <sub>m</sub>	23 38 29	28				
		L <sub>m</sub>	23 39 20	36				
		L <sub>m</sub>	23 43 49	24				
		L <sub>m</sub>	23 50 30	16				
24	-----	L <sub>m</sub>	0 03 10	24				
		L <sub>m</sub>	0 07 29	24				
		L <sub>m</sub>	0 10 16	20				
		to	0 51 ..					
		L <sub>repl</sub>	0 57 50	16				
		F <sub>m</sub>	1 05 ..					
30	-----	O?	6 28 13				11,970	? 107° 44' from eL- S? P and S masked by mi- croseisms.
		S <sub>m</sub> ?	6 55 06	6				
		eL <sub>m</sub>	7 21 22	26				
		L <sub>m</sub>	7 23 39	27				
		L <sub>m</sub>	7 24 16	20				
		L <sub>m</sub>	7 26 45	16				
			L <sub>m</sub>	7 28 03				A increased slightly.
		to	7 30 07	14				
		L <sub>m</sub>	7 28 45	20-16				
		L <sub>m</sub>	7 31 51	14-12				
		F <sub>m</sub>	7 49 ..					

\* Trace amplitude.

SEISMOLOGICAL DISPATCHES.<sup>1</sup>

## Santiago, Chile, Dec. 4, 1918.

An earthquake has occurred in Northern Chile. In the towns of Copiapo and Vallerer important damages were caused. In other localities damage of minor importance resulted.

Reports received here say that the earthquake destroyed Vallerer, and that it wrecked 10 per cent of the buildings at Copiapo. Several deaths occurred in Copiapo, where many persons are homeless. (Assoc. Pr.)

## Vancouver, British Columbia, Dec. 6, 1918.

This city was shaken violently by an earth tremor at 12:45 this morning. The tremors, which appeared to be from north to south, were felt for two minutes. A distinct rumbling was noticeable. Occupants of tall buildings were especially affected by the disturbance, many being seized with nausea.

The shock was felt in all parts of the city, many persons being awakened by the shaking of furniture and tumbling of dishes. (Assoc. Pr.)

## Victoria, British Columbia, Dec. 6, 1918.

A pronounced earthquake of several seconds' duration was felt here at 12:45 o'clock this morning. Houses shook and windows rattled all over the city. Island points in the immediate vicinity also reported noticing the disturbance. (Assoc. Pr.)

## Seattle, Washington, Dec. 6, 1918.

What was believed to be an earth disturbance was felt in Seattle at 12:45 o'clock this morning. The tremor shook buildings in the downtown district. (Assoc. Pr.)

## EARTHQUAKES FELT IN THE UNITED STATES DURING 1918.

[Consult also Chart XI (XLV-122) in this issue.]

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Professor in Charge of Seismological Investigations.

[Dated: Weather Bureau, Washington, Feb. 4, 1919.]

During the year 1918, 127 separate earthquakes strong enough to be felt were reported from different parts of the continental United States, as listed in the accompanying Table 1, and graphically represented (a dot for each report on Chart XI (XLVI-111)) at the end of this issue of the Review.

<sup>1</sup> Reported by the organization indicated and collected by the seismological station, at Georgetown University, Washington, D. C.

Earthquakes of moderate intensities, V-VI (Rossi-Forel), accompanied by only slight damage or none at all, occurred in California on February 11, March 6, 8, 21, 30, April 7, 23, 29, May 1, 2, June 3, 6, 14, 22, July 15, August 20, October 14, November 19, 29; in Arizona on April 21, 28; in Virginia on April 10; in the State of Washington on June 21, December 6; in Tennessee on June 22, October 16; in Oklahoma on September 11; in Arkansas on October 4, 13; and in Utah on November 16. The Virginia earthquake was apparently central in the vicinity of Luray and was felt over most of Virginia, a portion of West Virginia, much of Maryland, the District of Columbia, and into Pennsylvania.

Earthquakes of intensity, VII-VIII, accompanied by only a very moderate amount of damage, such as the fall of chimneys, occurred in California on March 12, apparently central near Downieville; and in Maine on August 21, apparently central near South Paris.

An earthquake of intensity, IX-X, accompanied by some destruction of property, occurred in California on April 21, when the entire business sections of Hemet and San Jacinto were destroyed. This shock was felt over southern California and Nevada, western New Mexico, and into Utah, and was apparently caused by a new slip in the San Jacinto Fault.

An earthquake of similar intensity occurred in New Mexico on May 28, causing an open break in the surface of the ground at Cerillos.

There remains to be mentioned the great earthquake, not shown on the chart, but given in the tables, which occurred in Porto Rico on October 11. A great tidal wave 2 miles wide swept inland a half mile at Aguadilla, rising to a height of 40 feet against the cliffs, destroying everything in its path, and drowning many people. Over 60 shocks were noted during the period from October 11 to November 12. The frequency diminished rapidly, as is usual, and had fallen to about one a day by the end of October.

TABLE 1.—Places in the United States reporting earthquakes during 1918.

[Consult also Chart XI (XLV-122) in this issue.]

Place.	Ap- proxi- mate lati- tude (north.)	Ap- proxi- mate longi- tude (west.)	Num- ber of quakes re- ported.	Place.	Ap- proxi- mate lati- tude (north.)	Ap- proxi- mate longi- tude (west.)	Num- ber of quakes re- ported.
ARIZONA.				CALIFORNIA.			
Aztec.....	32 49	113 28	1	Aguanga.....	33 27	116 55	2
Bouse.....	33 57	114 01	1	Arroyo Seco.....	34 07	118 11	1
Cibola.....	33 21	114 42	1	Bagdad.....	34 35	115 52	1
Crozier.....	35 24	113 40	1	Banning.....	33 55	116 53	1
Flagstaff.....	35 12	111 37	4	Barrett.....	32 42	116 41	3
Kingman.....	35 11	114 04	1	Barstow.....	34 54	117 02	1
Mohave City.....	35 02	114 38	1	Beaumont.....	33 55	117 00	3
Oatman.....	35 02	114 25	1	Big Bar.....	40 44	123 18	1
Parker.....	34 10	114 17	1	Bishop.....	37 23	118 24	3
Quartzsite.....	33 40	114 11	1	Blythe.....	33 35	114 41	1
Salome.....	33 47	113 37	1	Bonita.....	32 39	117 03	2
Seligman.....	35 19	112 51	1	Boulder Creek.....	37 08	122 07	1
Somerton.....	32 35	114 43	1	Brawley.....	33 00	115 31	1
Truxton.....	35 18	113 36	1	Cabazon.....	33 55	116 47	1
Wellton.....	32 40	114 08	1	Cahuilla.....	33 32	116 45	10
Wenden.....	33 49	113 32	1	Calexico.....	32 41	115 30	27
Yucca.....	34 52	114 09	1	Claremont.....	34 06	117 43	3
Yuma.....	32 45	114 36	2	Corona.....	33 53	117 34	3
ARKANSAS.				Coulterville.....	37 43	120 13	1
Bauxite.....	34 33	92 24	1	Downieville.....	39 34	120 50	2
Black Rock.....	36 08	91 02	2	El Cajon.....	32 48	116 59	3
Brinkley.....	34 53	91 07	1	Escondido.....	33 07	117 06	3
Carlisle.....	34 47	91 39	1	Eureka.....	40 48	124 11	8
England.....	34 32	91 52	1	Fairmont.....	34 45	118 26	1
Hardy.....	36 19	91 21	1	Fontana.....	34 06	117 27	1
Hoxie.....	36 03	90 55	1	Fort Bragg.....	39 25	123 47	1
Jonesboro.....	35 51	90 39	1	Fresno.....	36 43	119 49	1
Little Rock.....	34 45	92 06	1	Hemet.....	33 44	116 58	21
Lonoke.....	34 47	91 49	1	Hollywood.....	34 06	118 20	1
Pine Bluff.....	34 13	91 54	1	Imperial.....	32 51	115 33	1
Pocahontas.....	36 15	90 56	1	Indio.....	33 43	116 13	3
Scott.....	34 43	92 01	1	Julian.....	33 04	116 36	3
Searcy.....	35 15	91 39	1	Keeler.....	36 38	117 52	1
				Laguna Beach.....	33 31	117 47	1
				Lakeport.....	39 08	122 56	1

TABLE 1.—Places in the United States reporting earthquakes during 1918—Continued.

Place.	Ap- proxi- mate lati- tude (north).	Ap- proxi- mate longi- tude (west).	Num- ber of quakes re- ported.	Place.	Ap- proxi- mate lati- tude (north).	Ap- proxi- mate longi- tude (west).	Num- ber of quakes re- ported.	Place.	Ap- proxi- mate lati- tude (north).	Ap- proxi- mate longi- tude (west).	Num- ber of quakes re- ported.	Place.	Ap- proxi- mate lati- tude (north).	Ap- proxi- mate longi- tude (west).	Num- ber of quakes re- ported.
CALIFORNIA—con.				ILLINOIS.				NEW MEXICO— continued.				UTAH.			
Lone Pine.....	36 27	118 02	3	Anna.....	37 28	89 14	1	Las Vegas.....	35 35	105 14	1	Clarkston.....	41 55	112 05	1
Los Angeles.....	34 03	118 15	2	Cairo.....	37 00	89 10	2	Montoya.....	35 06	104 04	1	Milford.....	38 24	113 01	1
Mecca.....	33 24	116 05	2	MAINE.				Moriarty.....	34 59	106 03	1	Tremonton.....	41 42	112 10	1
Mesa Grande.....	33 10	116 46	6	Bridgton.....	44 03	70 42	1	Pena Blanca.....	35 35	106 21	1	VIRGINIA.			
Morgan Hill.....	37 08	121 38	2	Calais.....	45 11	67 17	1	Forvenir.....	35 43	105 25	1	Buchanan.....	37 32	79 41	1
Mt. Lowe.....	34 13	118 08	1	Cape Elizabeth.....	43 35	70 14	1	Santa Fe.....	35 41	105 57	1	Columbia.....	37 45	78 13	1
Mt. Wilson.....	34 13	118 04	3	Duck Pond Lake.....	43 46	70 21	1	Stanley.....	35 07	106 00	1	Culpeper.....	38 29	77 58	1
Nellie.....	33 19	116 52	3	Eastport.....	44 54	66 59	1	Valmora (Wat- rous).....	35 47	104 59	1	Dale Enterprise.....	38 27	78 55	2
Newhall.....	34 23	118 33	1	Lewiston.....	44 05	70 12	1	Waldo.....	35 28	106 10	1	Danville.....	36 34	79 26	1
North Fork.....	37 20	119 20	1	Little Sebago Lake.....	43 53	70 24	1	OKLAHOMA.				Gordonsville.....	38 09	78 11	1
Ocean Park.....	34 01	118 30	1	Norway.....	44 12	70 32	1	El Reno.....	35 31	97 57	3	Guinea.....	38 09	77 26	1
Olaf.....	34 25	118 12	1	South Paris.....	44 13	70 30	1	Fort Reno.....	35 33	98 02	2	Harrisonburg.....	38 25	78 52	1
Paso Robles.....	35 37	120 42	1	MARYLAND.				Union City.....	35 23	97 57	3	Luray.....	38 41	78 27	2
Point Loma.....	32 43	117 15	2	Bagley.....	39 30	76 23	1	Yukon.....	35 30	97 44	1	Lynchburg.....	37 25	79 09	1
Pomona.....	34 03	117 45	1	Baltimore.....	39 17	76 37	1	OREGON.				New Canton.....	37 43	78 23	1
Redlands.....	34 03	117 11	1	Chewsville.....	39 37	77 37	1	Portland.....	45 32	122 41	1	Norfolk.....	36 51	76 17	1
Rialto.....	34 06	117 22	2	Clear Spring.....	39 37	77 55	1	PENNSYLVANIA.				Orange.....	38 15	78 07	1
Riverside.....	33 59	117 23	2	College Park.....	38 58	76 55	1	Colebrook.....	40 26	76 04	1	Rapidan.....	38 19	78 04	1
Round Valley.....	37 25	118 46	1	Solomons.....	38 19	76 27	1	PORTO RICO.				Richmond.....	37 32	77 27	1
Salinas.....	36 41	121 39	3	Takoma Park.....	38 58	77 01	1	Aguadilla.....	18 26	67 09	60	Roanoke.....	37 16	79 56	1
San Bernardino.....	34 06	117 18	2	Woodstock.....	39 19	76 32	1	Isabela.....	18 30	67 03	60	Staunton.....	38 10	79 04	1
San Bernardino Mt.....	34 07	116 56	1	MICHIGAN.				Mayaguez.....	18 12	67 09	1	Suffolk.....	36 43	76 35	1
San Diego.....	32 43	117 10	4	Calumet.....	47 14	88 28	1	San Juan.....	18 29	66 07	5	University.....	38 02	78 31	1
San Diego (Camp Kearny).....	32 56	117 10	2	Morrice.....	42 51	84 11	1	TENNESSEE.				White Post.....	39 04	78 07	1
San Jacinto.....	33 46	116 58	9	MISSOURI.				Clarksville.....	36 31	87 22	1	Williamsburg.....	37 16	76 43	1
San Luis Obispo.....	35 18	120 39	1	Hannibal.....	39 41	91 20	1	Clinton.....	36 06	84 08	1	Winchester.....	39 10	78 10	1
San Miguel Island.....	34 02	120 20	1	NEVADA.				Kingston.....	35 52	84 32	1	Woodstock.....	38 53	78 31	1
Santa Ana.....	33 46	117 53	1	Winnemucca.....	40 58	117 43	1	Knoxville.....	35 56	83 58	2	WASHINGTON.			
Santa Monica.....	34 02	118 30	4	NEW MEXICO.				Lenoir City.....	35 47	84 17	1	Longmire.....	46 46	121 50	1
Spreckels.....	36 38	121 36	1	Albuquerque.....	35 06	106 39	1	Loudon.....	35 44	84 21	1	North Fork Sauk River.....	48 06	121 22	1
Stanford Univer- sity.....	37 25	122 10	1	Carillos.....	35 27	106 07	1	McGhee.....	35 35	84 14	1	Seattle.....	47 38	122 20	1
Table Bluff.....	40 41	124 10	1	Espanola.....	36 00	106 05	1	Memphis.....	35 09	90 03	2	Walla Walla.....	46 02	118 20	1
Valley Cntr.....	33 13	117 04	1	Espanola.....	34 49	106 04	1	Philadelphia.....	35 41	84 25	1	White Bluff.....	47 40	117 35	1
Vanice.....	33 58	118 28	4	Lamy.....	35 29	105 03	1	Savannah.....	35 12	85 15	1	Prairie.....			
Victorville.....	34 32	117 13	2	DISTRICT OF COLUMBIA.				Sweetwater.....	35 36	84 29	1	WEST VIRGINIA.			
Warner Springs.....	33 17	116 39	6	Washington.....				Union City.....	36 26	89 04	1	Buckhannon.....	38 59	80 15	1
Whitewater.....	33 53	116 38	1									Martinsburg.....	39 28	77 58	1
Whittier.....	33 58	118 04	1												
Winchester.....	33 42	117 06	1												
Workman Sta- tion.....	33 55	118 11	1												